

Appl. No. 10/605,416
Amtd. dated May 02, 2005
Reply to Office action of April 12, 2005

Amendments to the Specification:

Please replace paragraph [0020] [0022] and [0027], with the following amended paragraph:

[0020] The main difference between the color LCD 31 of the present invention and the conventional transmissive color LCD 11 is that the color LCD 31 uses a predetermined mask pattern design including a plurality of matrix or interlaced patterns to reduce a resolution of the patterns and also uses the restriction of photo resist due to the reduced resolution to form a plurality of recess structures with either uniform size or non-uniform size on surfaces of the color filters 23R, 23G, 23B during a development process. And, the recess structures comprise the convex structures and valley structures. Therefore, the transmittance of the color filters 23R, 23G, 23B is increased, and the brightness of the color LCD 31 is effectively improved.

[0022] Additionally, the color filters with recess structures of the present invention can also be applied to a reflective or a transflective color LCD. A reflective color LCD 51 is provided as a second embodiment of the present invention, as shown in Fig.4. The reflective color LCD 51 comprises a lower glass substrate 49, an upper glass substrate 42 positioned parallel to and above the lower glass substrate 49, and a plurality of pixel units 45 positioned between the lower glass substrate 49 and the upper glass substrate 42. Each of the pixel units 45 includes a red color filter 43R, a green color filter 43G, or a blue color filter 43B, and an upper transparent electrode 44, a liquid crystal layer 46, a lower transparent electrode 48, and a reflection layer 47. An exposed portion of the surfaces of the upper glass substrate 42 and the lower glass substrate 49 respectively includes an upper polarizer 41 and a lower polarizer 50. The reflective color LCD 51 further comprises a plurality of thin film transistors (not shown in Fig.4) for controlling the pixel units 45. A plurality of recess structures are formed on surfaces of the color filters so as to increase the transmittance of the color filters and further improve the brightness and regulate the color deepness of the color LCD 51. And, the recess structures comprise the

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convex structures and valley structures.

[0027] The color LCD provided by the present invention comprises color filters with recess structures. And, the recess structures comprise the convex structures and valley structures. Consequently, the transmittance of the color filters can be effectively increased, which results in an improvement of brightness of the LCD, and a color deepness of the color LCD can be regulated. Comparing to a prior art color LCD, the problem of a non-uniform cell gap caused by forming holes in the color filters can be prevented. For a transreflective color LCD, the recess structures of the present invention can be formed only on surfaces of reflective regions of the color filters so as to reduce a difference in brightness and color deepness occurred between the reflective region and the transmissive region of the same pixel unit. Furthermore, because the color filters with recess structures are able to scatter light, a diffusing layer of the transreflective LCD can be omitted, and a cost of the transreflective LCD is substantially reduced.

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